we can hardly agree with the statement that "clay is identical in composition with felspar" (p. 46), when we remember that the one contains about 47 and the other about 65 per cent. of silica; it is somewhat a surprise to find the old time-honoured section of a mountain chain, given in Fig. 34, p. 80, still surviving; if one wished to select a section of what a mountain-chain is not like, here we have it. What would Mr. Huggins say to the statement on p. 17, that "the nebulæ are now known to be in no respect nebulous"? On p. 22 we are told that, "when a typical felspar contains potash, it is recognised by fracturing at right angles to the side (*sic*) of the prism." This is hardly calculated to convey a notion that potash felspar has two cleavages, and certainly gives no definite idea of the direction of either.

The treatment of the subject of joints is bewildering; it reminds me of the advice given to a youthful and diffident teacher, "If you are asked to explain any thing you don't understand, look solemn and talk of polar forces." We have vague hints that the crystallisation of monoclinic augite and triclinic plagioclase may in some mysterious and unexplained way have determined the direction of the cracks on the hexagonal jointing of basalt, and that the structure is essentially crystalline (p. 43); then, on p. 82, our mind is unsettled by the statement that tension in successively different directions is more probably the true cause of the phenomena of jointing in slaty rocks; then heat and electricity, it is surmised, may have had something to do with it. Surely in the place of these guesses, or at least in addition to them, it would have been well to mention some of the facts that throw light on the solution of the problem; that the columnar structure of basalt is closely mimicked by the hexagonal columns of starch and dried clay in the formation of which crystallisation took no share; and that Daubrée has produced, by torsional strain, cracks, the directions of which follow the same law as governs the trend of master-joints in rocks. It is this preference of shadowy surmise to solid substantial fact which constitutes one main fault of the book. The notice of "reversed faults" on p. 77 is incomplete; Rogers and Heim have taught us that these are the rule in violently contorted districts, and the latter has given a beautiful explanation of how they have been produced. The formation of coal is dismissed in ten lines, at least this is the only reference to coal given in the index, and I have not found anything on the subject elsewhere in the book. When I think what an admirable instance of inductive reasoning the discovery of the terrestrial origin of coal supplies, and how the study of sound inferences like this is one of the best ways of developing the logical faculty in the student, I cannot help regretting that some of the questionable speculations with which the book abounds have not been left out to make room for an account of the way in which this truth was arrived at. I fear very much that the directions given on p. 253 will not help the student much to identify minerals under the microscope. One would gather from them that colour was the one important point to attend to, for this is almost the only thing noticed; and it is strange that in the case of olivine, where the extreme vividness of the colours is of some little use as a distinctive test, no notice is taken of the fact. Amphibole, it would seem, is to be distinguished from pyroxene by giving brighter colours, but the widely different cleavages of the two minerals, and the dichroism of the one and its absence in the other are passed over. Nor is a word said about the dichroism of tourmaline and magnesian mica. Of the many points to be attended to only one is mentioned, and the most important facts under that head are omitted.

For such reasons as I have given I cannot help feeling that this work is unsuited for teaching purposes; indeed, on account of the way in which it mixes up theory and fact, I should say it would be positively dangerous to put it into the hands of a beginner.

But it will be by no means without its use to those who have made some progress in the study of geology. It is an admirable geological gazetteer. The long lists of localities where typical examples of the various classes of rocks may be studied and the condensed descriptions of the geological structure and history of the various districts cited, will be of great value. References to original memoirs are frequently given, but they might be largely increased with great advantage; it would be scarcely possible to make them too numerous. There is much, too, in the speculative portion of the book, which, even if it be in places hazy and but slightly supported either by observation or experiment, is still very acceptable. Even the guesses of an acute and original thinker are welcome.

In the section devoted to palæontology the puzzles and uncertainties of that branch of geology are stated without reserve, and the lines on which the palæontologist must work are clearly marked out. The chapter on the "Succession of Life in Classes and Orders of Animals" is too crowded with detail for beginners, but I fancy that the advanced student will often turn to it for reference and thank the author for having furnished him with such a concise index to the subject. The brief indications given under each head will serve as starting points, and as he develops and expands his knowledge by the aid of special treatises and original memoirs, the student will find out for himself where the author is propounding his own peculiar views, and where he is in accord with his fellow-palæontologists.

A. H. GREEN

OUR BOOK SHELF

Transit Tables for 1885. By Latimer Clark, M.I.C.E., &c. (London: E. and F. N. Spon, 1885.)

AT a period when the question of universal time is in every one's thoughts, more or less, these tables should possess more than ordinary interest. By the production of a simple, efficient, and inexpensive transit instrument Mr. Clark first demonstrated that transit observations were within the power of others than the professional astronomer or the wealthy amateur, and that by these observations timekeepers could be regulated to the fraction of a second. The next step was to simplify the calculations involved in the reduction of these observations, by the yearly publication of tables giving in Greenwich mean time, instead of sidereal time, the transits of the sun and a few of the principal stars conveniently situated for observations for every day in the year. This is chiefly what is accomplished in these tables, now in their fourth year of publication. In addition to the fundamental stars, the transits of five of which are given for every

© 1885 Nature Publishing Group

day in the year, there are tables by which the transits of about twenty others can be computed by the simple addition of their R.A. converted into mean time from that of one of the fundamental stars. The transits of the major planets and of certain bright stars suitable for daylight observations are also given, and the tables show the declination and meridian altitude of sun, stars, and planets. There is a monthly ephemeris, and in additional tables will be found the time of sunrise and sunset, daybreak and nightfall, the sidereal time at a certain epoch of mean time (9 p.m.), and the sun's semi-diameter for every alternate day. In the preface are clearly-written instructions for fixing and adjusting the instrument, and for obtaining local or Greenwich time at any place in England or abroad. The times are given to the nearest tenth of a second, and the tables are clearly printed in bold type.

Reise nach der Insel Sachalin in den Jahren 1881-1882. Von J. S. Poljakow. Aus dem Russischen übersetzt von Dr. A. Arzruni. (Berlin: Asher and Co. 1884.)

THE author of this volume is a zoologist who filled for a considerable period the office of Conservator of the Zoological Museum of the Russian Academy of Sciences. He has also travelled widely on scientific missions in outlying parts of the Russian empire, and has already studied a portion of the zoological collections sent home by Col. Prejevalski from his Central Asian journeys. The importance which the large island of Saghalin, off the mouth of the Amour, is believed to possess for Russia, led the Geographical Society of St. Petersburg to despatch Mr. Poljakow to study the island and to report upon it from a scientific and economic point of view. He took passage from Odessa accordingly, in a ship conveying convicts, and arrived at the mouth of the Djuka, in Saghalin, in June, 1881. During the succeeding fourteen months he travelled all over the island, along the water-ways—which are the only ways there—when travelling was possible, and arranged his collections when the weather and the season rendered advance impossible. This volume is composed of the letters addressed to the secretary of the Geographical Society, detailing his movements when travelling. For the most part they are such as the most unscientific traveller might address to a friend: they describe the incidents of his various journeys, the superficial customs of the natives he met, the difficulties of travel, his views of the island as a penal colony, its agricultural and mining prospects, and much else of a general and chatty kind. Here and there in the course of the narrative it is apparent that behind these ordinary incidents of travel there is a scientific purpose, which only comes out casually and by chance. Not that there is any concealment about the work; but the real results of the exploration will probably need more examination and arrangement than he has yet been able to give to them. Towards the end he summarises his work in the island, and the summary is worth giving, as showing us what we may expect from him now that he has time for study and arrangement. His collections on leaving the island were, he tells us, enormous. He possessed all the most important representatives of the mammals, birds, fishes, and amphibia, as well as numerous examples of the lower animal world—insects, crustacea, mollusks, &c. One of the most important places in his collection is occupied by ethnographical and anthropological objects. He has ample material to investigate and characterise the original population of the island, which has now disappeared, viz. that of the Stone Age, as well as the race which dwelt around Patience Bay, and which knew the use of metals. It is highly probable, he thinks, that aborigines who belonged to the Aino stem were so numerous a century and a half or two centuries ago at the mouth of the Poronai River that their settlements on a limited space then contained a larger population than the whole of the island does to-day. The present inhabitants, the Gilyaks and the Orokos, have retained many of the characteristic features of the culture of their predecessors. The present inhabitants of Saghalin, like the former, concentrate all their activity in hunting and fishing, and they seek their sustenance on the land as well as in the seas and rivers. He notices that the natives, and especially those of the southern part of the island, have been largely influenced by the Japanese, who go there in the summer to catch fish, and that this influence has lasted for centuries. It is only a few years since the Russians commenced to settle Saghalin, in order to introduce European agriculture and industry. Their first task was to work the coal-measures and to develop agriculture and stock-raising. But there are great difficulties to be overcome. Coal-mining, Mr. Poljakow thinks, will be successful when the methods are completed, the prices lowered, and the delivery of the coal on board ship rendered easier. The rough and cold climate must always be an obstacle to farming; marshes cover a large part of the island, and the larger rivers are subject to frequent alteration of their beds. In fact, the climate and topography of Saghalin offer no natural advantages that would lead one to prophesy smooth things of its agricultural future. The development of the fisheries would form an undoubted source of income, as salmon and herrings are numerous and can easily find neighbouring markets. "I left the island of Saghalin," concludes Mr. Poljakow, "persuaded that it was possible—nay, advantageous—for the State to cultivate, even if forced labour has to be employed. On the other hand, it was clear to me that the results obtained so far by no means correspond with the means and efforts directed to that object." The absence of a map, however small, to accompany the book is a serious inconvenience.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Gardiner's Researches on the Continuity of Vegetable Protoplasm

DR. JULES SCHAARSCHMIDT, in a paper (NATURE, January 29, p. 290) on "Continuity between the Protoplasmic Contents of Adjacent Cells in Plants," gives what he calls "the history of this subject." But he makes no reference to the elaborate memoir by Mr. Walter Gardiner which I communicated on behalf of that gentleman to the Royal Society. This was read on April 26, 1883, and is published in the third part of the *Philosophical Transactions* for that year.

Dr. Schaarschmidt states in his communication that in 1884 he "claimed the universality of the communication (at least in tissues)." I do not myself feel that the establishment of individual claims to unoccupied territory is as important in the scientific as it appears to be in the political world. Still I think it is only due to Mr. Gardiner to quote in reference to this statement of Dr. Schaarschmidt's, the following passage (the italics are mine) from the conclusion (p. 858) of Mr. Gardiner's memoir:—

"Although I am aware of the danger of rushing to conclusions, I cannot but remark that when these results—which were foreshadowed by Sachs and Hanstein when they discovered the perforation of the sieve-plate—are taken in connection with those of Russow, it appears extremely probable that, not only in the parenchymatous cells of pulvini, in phlœm parenchyma, in endosperm cells, and in the prosenchymatous bast-fibres, is

© 1885 Nature Publishing Group